

CLAIMS

I claim:

1. A process for forming a composite part comprising the steps of:
providing a pair of sheet metal skins, each of said skins having a thickness of at least about 0.005 in.;
placing a paper layer which has been impregnated with resin between and in contact with said skins of sheet metal to form a composite stack;
placing said stack in a die press, said die press having at least one non-planar surface in contact with said stack; and
applying uniform pressure to said stack with said die press for sufficient time to bond together said skins and said paper layer while in the same operation forming a non-planar part from said stack.
2. The process for forming a composite part recited in claim 1, wherein said paper layer contains volatile solvents and water and further including the step of heating said paper layer prior to placing said paper layer between said metal skins in order to reduce the content of said volatile solvents and water in said paper layer.
3. The process for forming a composite part recited in claim 1, wherein said uniform pressure does not vary more than 10% at any two points along the surface of said stack.
4. The process for forming a composite part recited in claim 1, wherein a gap exists between opposed die surfaces of said die press and wherein said gap has a uniform width and wherein said uniform width does not vary more than about 2% at any two points along said gap.

5. The process for forming a composite part recited in claim 2, wherein the total combined quantity of volatile compounds and water in said paper layer is reduced to less than about 5% by weight of said paper layer.

6. The process for forming a composite part recited in claim 1, wherein said sheet metal is selected from the group consisting of cold rolled steel, galvanized steel, tin-coated steel and stainless steel.

7. The process for forming a composite part recited in claim 1, wherein said paper layer is adhesively bonded to said skins of sheet metal.

8. The process for forming a composite part recited in claim 1, wherein each of said skins has a thickness of from about 0.007 in. to about 0.030 in.

9. The process for forming a composite part recited in claim 1, wherein said paper layer has a thickness of at least about 0.01 in.

10. The process for forming a composite part recited in claim 1, wherein said paper layer has a thickness of from about 0.01 in. and 0.05 in.

11. The process for forming a composite part recited in claim 1, further including layers of adhesive disposed between said paper layer and each of said skins.

12. The process for forming a composite part recited in claim 1, wherein said sheet metal skins are zinc coated steel which has been cold rolled with zinc on the surface.

13. The process for forming a composite part recited in claim 1, wherein said metal skins are formed of low carbon micro-alloyed high-strength steel.

14. The process for forming a composite part recited in claim 2, wherein said sheet metal is selected from the group consisting of cold rolled steel, galvanized steel, tin-coated steel and stainless steel.

15. The process for forming a composite part recited in claim 2, wherein said paper layer is adhesively bonded to said skins of sheet metal.

16. The process for forming a composite part recited in claim 2, wherein each of said skins has a thickness of from about 0.005 in. to about 0.030 in.

17. The process for forming a composite part recited in claim 2, wherein said paper layer has a thickness of at least about 0.01 in.

18. The process for forming a composite part recited in claim 2, wherein said paper layer has a thickness of from about 0.01 in. and 0.05 in.

19. The process for forming a composite part recited in claim 2, further including layers of adhesive disposed between said paper layer and each of said skins.

20. The process for forming a composite part recited in claim 2, wherein said sheet metal skins are zinc coated steel which has been cold rolled with zinc on the surface.

21. The process for forming a composite part recited in claim 2, wherein said metal skins are formed of low carbon micro-alloyed high-strength steel.

22. The process for forming a composite part recited in claim 2, wherein said paper layer is multiple layers.